EXECUTIVE SUMMARY

The following discussion concisely summarizes pertinent information presented in each section of the Preliminary Assessment/Site Inspection (PA/SI) Report for the Wendover Air Force Auxiliary Field Range (Wendover AFAFR) - Nevada.

INTRODUCTION

This PA/SI Report contains an assessment of the portion of the Wendover AFAFR that is located in Nevada, referred to as Wendover AFAFR-Nevada in the PA/SI Report. Hill Air Force Base (HAFB) has proactively conducted a PA/SI of Wendover AFAFR-Nevada to identify potential areas of interest (AOIs) resulting from former and current military use of this range. This is one of the few range-related environmental investigations conducted at Wendover AFAFR-Nevada. An inventory report was conducted at Formerly Used Defense Sites (Earth Tech, 1992), and several Draft Environmental Assessments and Baseline Surveys were conducted by Applied Ecological Services, Inc. A PA/SI was also previously conducted for the Wendover Air Force Auxiliary Field. However, this PA/SI excluded the range portion of the property with the exception of Site K, a landfill west of Wendover AFAF and Site 20, an ordnance disposal area described as 4 miles southwest of Wendover. A discussion of Site 20 was included in the work plan to perform the site inspection of Wendover AFAFR-Nevada (AGEISS, 1999). A PA for the portion of the Wendover AFAFR that is located in Utah was conducted concurrent with this PA/SI and is presented in a separate report.

The purpose of this PA/SI Report is to explain the methodology used to conduct the PA/SI, present the information collected during the PA/SI, present the PA/SI results and conclusions, and recommend additional activities to be performed after this PA/SI. These additional activities are referred to as further actions at Wendover AFAFR-Nevada. The objective of this PA/SI is to identify any release or threat of release of a hazardous substance, pollutant or contaminant at the range. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is identified as the appropriate statutory mechanism under which to conduct the PA/SI. HAFB intends to conduct its investigations and any associated response actions under lead agency authority as provided by CERCLA with the concurrence/signatory authority of the State of Nevada Department of Conservation and Natural Resources, Division of Environmental Protection.

BACKGROUND INFORMATION AND PHYSICAL CHARACTERISTICS

Wendover AFAFR-Nevada is in eastern Elko County, NV. Nearby cities and towns include Salt Lake City, Tooele, and Grantsville, UT to the east and Wendover, UT/West Wendover, NV to the north. Oasis and Elko, NV are to the west. Several transportation corridors are in the area, including two railroad lines and Interstate Highway 80.

The U. S. War Department, predecessor to the U.S. Department of Defense, identified a tract of land in the desert to be used as a flight training area. In 1940, the site was designated as a general purpose range for aerial gunnery and bombing practice. Following World War II, Wendover AFAFR-Nevada was also used for missile and experimental aircraft testing. The Wendover AFAFR-Nevada is currently unused by the military.

METHODOLOGY

Data were collected during the PA/SI to identify pertinent information about former and current activities at Wendover AFAFR-Nevada, including interview information, observational information from site visits, and aerial photographs, maps, and reports from record searches. The availability, usability, and reliability of the data were evaluated and the

data were compiled into an electronic database. A relational database contains all data obtained or generated during the PA/SI. A geographical information system database, a subset of the relational database, is the spatial representation of the location information in the relational database. The electronic database allows the data to be preserved in detail while providing easy access to the data.

To develop the decision framework for identifying AOIs at Wendover AFAFR-Nevada, pertinent statutes, regulations, executive orders, and guidance documents were reviewed and the following definition describing an AOI at an active or inactive military range was developed.

1) A location at which a release of a hazardous substance, pollutant, or contaminant as defined under CERCLA Sections 101(14) and 101(33) has or could potentially occur that may pose a threat to human health or the environment, or
2) A location at which consolidated, used military munitions are buried

Although a potential exists for encountering unexploded ordnance at or below ground surface at an active or inactive range, identifying AOIs based on this random potential was not an objective of the PA/SI. To be identified as an AOI, the area must have location coordinates, have not been investigated under a previous PA/SI, and meet one of the following criteria:

- Is an apparent man-made, covered, surface depression or mound having unknown contents
- Contains consolidated, buried, used military munitions
- Has a potential for a release of a hazardous substance, pollutant, or contaminant that may pose a threat to human health or the environment

Because the complete contents are unknown at man-made, covered, surface depressions or mounds and areas where consolidated used military munitions have been buried, the potential for release is unknown. Including these areas as AOIs is a conservative approach. After AOIs were identified, they were classified using the following classification system developed for Wendover AFAFR-Nevada which is based on a similar system developed by Radian International (Radian Int'l, 1997) for the Utah Test and Training Range-North.

- **Class I - Potential Hazardous Substance, Pollutant, or Contaminant Release with No Evidence of Consolidated Used Military Munitions Burial:** Class I AOIs exhibit evidence that a hazardous substance, pollutant, or contaminant release has or could potentially occur that may pose a threat to human health or the environment. Burial of consolidated used military munitions would not have occurred at a Class I AOI.

- **Class II - Potential Consolidated Used Military Munitions Burial:** Class II AOIs exhibit evidence of consolidated used military munitions burial. Because the used military munitions are buried, it cannot be determined at this time whether a hazardous substance, pollutant, or contaminant release has or could potentially occur that may pose a threat to human health or the environment. Class II AOIs might be applicable for further evaluation under the proposed Range Rule.

- **Class III - Unknown Hazardous Substance, Pollutant, or Contaminant Release or Consolidated Used Military Munitions Burial:** Class III AOIs include apparently man-made surface depressions or mounds that are covered and could potentially contain consolidated used military munitions or hazardous substances, pollutants, or contaminants that may pose a threat to human health or the environment. However, information is not available at this time to confirm such potential.

Data in the electronic database that were not identified as AOIs are referred to as "Other Identified Areas" in this PA/SI Report. These data were placed in to one of the following categories to provide HAFB with an inventory of all data evaluated during the PA/SI:

- Unconsolidated, used military munitions (Type A)
- Consolidated, unburied, used military munition fragments (Type B)
- Nonhazardous materials (Type C)
- Small quantity of hazardous substances, pollutants, or contaminants (Type D)
- Named targets (Type E)
- Permitted facilities (Type F)
- Potential AOIs with no location coordinates (Type G)
- Areas containing petroleum products that impact groundwater or surface water (Type H)
- Other military related areas (Type I)
- Other nonmilitary related areas (Type J)
- Sites previously investigated (Type K)

After the AOIs were identified at the range during the PA, a SI was performed to test hypotheses generated during the PA. For example, for AOIs that were suspected to contain consolidated, used, buried military munitions, a magnetometer survey was performed. If an AOI was considered to have a potential for a release of a hazardous substance, pollutant, or contaminant based on the historical use and AOI characteristics, environmental samples were collected.

During the SI, groundwater samples were collected from three sample points at AOI W06NV using direct-push technology. The groundwater sample points at AOI W06NV were located on the assumed upgradient and downgradient sides of the evaporation pond, and in the center of the evaporation pond. Groundwater sample depths at AOI W06NV ranged from 12 to 18 feet below ground surface. The groundwater samples were submitted for analysis of explosives, metals, semivolatile organic compounds (SVOCs), and nitrate/nitrite. Soil samples were also collected during the SI at Wendover AFAFR-Nevada using direct-push technology and grab sampling methods. Two surface-soil grab samples were collected at both AOIs W01NV and W02NV in areas with high concentrations of buried drums. The soil samples collected at AOIs W01NV and W02NV were submitted for analysis of total cyanide. One surface soil sample was collected from the bottom of the crater designated as AOI W04ANV and one surface soil sample was collected from the bottom of the crater designated as AOI W04BNV and were submitted for analysis of explosives and metals. Four surface-soil grab samples were collected at AOI W06NV and submitted for analysis of explosives, metals, and SVOCs. One subsurface soil sample and a duplicate subsurface soil sample were collected from the sample point in the center of the evaporation pond and submitted for analysis of explosives, metals, and SVOCs. Field quality control samples were also collected during sampling activities in accordance with the SI Work Plan (AGEISS, 1999).

In addition to the environmental samples collected during the SI, magnetometer surveys were performed at AOIs W03NV, W04ANV, and W05NV. The magnetometer surveys were performed with a Scintrex MP-2 proton precession magnetometer, which was used to evaluate if buried ferrous metallic objects are present at these AOIs. A magnetometer survey was not performed at the crater designated as AOI W04BNV, which is the original crater identified as an AOI at this location, due to obvious signs that ferrous metallic objects had been buried in this crater.

Based on analytical results of environmental samples collected during the SI, SI scores were calculated for Class I AOIs. The SI scores were calculated following the methodology described in EPA Guidance for Performing Site Inspections under CERCLA (EPA, 1992). The significant pathways considered were

groundwater, soil, and air. Surface water was not considered a pathway when scoring the AOIs because only ephemeral surface water drainages are present at Wendover AFAFR-Nevada and surface water is not used for drinking, irrigation, to water livestock, aquaculture, in commercial food preparation, or as a water supply for a recreation area.

RESULTS

Over 150 pieces of data were obtained during the PA data collection effort. From these data, one permitted facility and six AOIs were identified at Wendover AFAFR-Nevada. The City of West Wendover's Wastewater Plant, located in the northern portion of the range, is permitted by the Nevada Division of Environmental Protection, Bureau of Water Pollution Control. Half of the identified AOIs are located in the eastern portion and the other half in the western portion of the range. Table ES-1 lists the AOIs by class and briefly summarizes each AOI. Table ES-2 summarizes Wendover AFAFR-Nevada AOI analytical results and SI scores.

Magnetometer survey results indicated that no magnetic anomalies were detected at AOIs W03NV and W05NV. The magnetometer survey performed at the crater designated as W04BNV indicated three separate magnetic anomalies were present. The most notable anomaly at W04BNV indicated an object at 1 to 6 feet below ground surface with a diameter of approximately 10 feet. The other two magnetic anomalies at W04BNV were classified as possible anomalies due to the scattering of smaller ferrous metallic objects. These possible anomalies were estimated to be between 1 to 4 feet below ground surface.

CONCLUSIONS AND RECOMMENDATIONS

Three Class I, one Class II, and two Class III AOIs were identified at Wendover AFAFR-Nevada (Table ES-1). Of these, two are gully fills, one is a structure, one is a crater, one is a pit, and one is a mound type AOI. The majority of the Class I AOIs (i.e., two of three) and half of the Class III AOIs are located in the eastern portion of the range. The remaining three AOIs, a Class I, II, and III AOI, are located in the western portion of the range. All of the AOIs are located less than 4 miles from a range boundary. Although there are no formal recreational areas located adjacent to or within Wendover AFAFR-Nevada, there are areas of frequent use and historical trespass. None of the AOIs are located within a known unique, unusual, or threatened habitat. Table ES-1 lists the recommended further actions for each identified AOI, based on the SI results.

Table ES-1. Wendover AFAFR-Nevada Areas of Interest.

Class	AOI Number	AOI Name	AOI Type	General Location	Brief Description	Recommended Further Actions
I	W01NV	Sodium Cyanide Drums	Gully Fill	Western portion of the range, east of Highway 93A.	A gully containing approximately 35 randomly distributed 30-gallon drums that were labeled to have contained sodium cyanide.	No further action is recommended at this site.
	W02NV	Sodium Cyanide Drums	Gully Fill	Western portion of the range, east of Highway 93A.	A gully containing approximately 74 randomly distributed 30-gallon drums that were labeled to have contained sodium cyanide.	No further action is recommended at this site.
	W06NV	Evaporation Pond	Structure	Eastern portion of the range, west of the Nevada/Utah state line.	An abandoned evaporation pond that received effluent from the former Wendover Air Force Auxiliary Field Sewage Treatment Plant.	No further action is recommended at this site.
II	W04NV	Burial Craters	Crater	Southeastern portion of the range, northeast of Nine Mile Hill.	Two partially backfilled craters, W04ANV and W04BNV, with numerous pieces of metal fragments protruding from the soil or scattered near the craters.	♦ Conduct further investigation to delineate the AOI's boundaries. ♦ Implement a worker awareness program which identifies W04ANV and W04BNV as potentially hazardous areas ♦ Restrict access to the sites until the sites can be rendered safe by subsurface investigation and/or removal of hazardous or potentially hazardous materials, including UXO. ♦ Prepare a Site Management Plan if further investigation activities are not performed. ♦ Evaluate W04ANV and W04BNV in accordance with the Range Rule when it is promulgated.
III	W03NV	Disturbed Area	Pit	Southwestern portion of the range, north of Nine Mile Hill.	A disturbed area in which unidentified materials may have been buried.	No further action is recommended at this site.
	W05NV	Potential Burial Mound	Mound	Eastern portion of the range, west of the Nevada/Utah state line.	An elongate mound in which unidentified materials may have been buried.	No further action is recommended at this site.

AOI Area of Interest
UXO Unexploded Ordnance

Table ES-2. Wendover AFAFR-Nevada Detectable Analytes and AOI SI Scores.

AOI Number	Media Sampled	Analyte Detected	Concentration Detected	Benchmark Value[a]	Site Inspection Score
W01NV	Soil	None	NA	NA	0
W02NV	Soil	None	NA	NA	0
W04ANV	Soil (µg/kg)	Aluminum	7,300,000 (J)	100,000,000	Site not scored
		Barium	230,000 (J)	100,000,000	
		Calcium	90,000,000	NA	
		Chromium	7,000	450,000	
		Copper	62,000 (J)	76,000,000	
		Iron	6,900,000	100,000,000	
		Lead	3,200	1,000,000	
		Magnesium	16,000,000	NA	
		Manganese	170,000	32,000,000	
		Mercury	130	610,000	
		Nickel	17,000 (J)	41,000,000	
		Potassium	5,300,000	NA	
		Sodium	15,000,000	NA	
		Vanadium	14,000	14,000,000	
		Zinc	230,000 (J)	100,000,000	
W04BNV	Soil (µg/kg)	Aluminum	5,900,000 (J)	100,000,000	Site not scored
		Barium	270,000 (J)	100,000,000	
		Calcium	110,000,000	NA	
		Chromium	6,800	450,000	
		Copper	44,000 (J)	76,000,000	
		Iron	6,800,000	100,000,000	
		Magnesium	17,000,000	NA	
		Manganese	200,000	32,000,000	
		Nickel	7,000 (J)	41,000,000	
		Potassium	4,300,000	NA	
		Sodium	11,000,000	NA	
		Vanadium	12,000	14,000,000	
		Zinc	90,000 (J)	100,000,000	
W06NV	Soil (µg/kg)	Aluminum	400,000-910,000 (J)	100,000,000	11.2
		Arsenic	3,300-4,000	440,000	
		Barium	130,000-190,000 (J)	100,000,000	
		Calcium	150,000-180,000	NA	
		Chromium	2,600-6,800	450,000	
		Copper	4,200-11,000 (J)	76,000,000	
		Iron	370,000-750,000	100,000,000	
		Lead	3,000-3,100	1,000,000	
		Magnesium	200,000-650,000	NA	
		Manganese	130,000-190,000	32,000,000	
		Nickel	3,900-8,000 (J)	41,000,000	
		Potassium	210,000-460,000	NA	
		Sodium	280,000-370,000	NA	
		Vanadium	9,000-18,000	14,000,000	
		Zinc	19,000-40,000 (J)	100,000,000	

Table ES-2. Wendover AFAFR-Nevada Detectable Analytes and AOI SI Scores.

AOI Number	Media Sampled	Analyte Detected	Concentration Detected	Benchmark Value[a]	Site Inspection Score
W06NV	Groundwater (µg/L)	Total Dissolved Solids	7,470,000	10,000,000	11.2
		Arsenic	31	NA	
		Barium	30-42 (J)	2,000	
		Calcium	160-9,000	NA	
		Magnesium	73,000	NA	
		Manganese	20-160 (J)	NA	
		Nickel	6 (J)	NA	
		Potassium	13,000	NA	
		Sodium	1,600-1,800	NA	
		Zinc	23-32	NA	

a Benchmark values are EPA Region 9 Preliminary Remediation Goals for soil samples and Federal maximum contaminant levels for groundwater samples.

J Data is qualified as estimated due to the presence of matrix interferences

AFAFR Air Force Auxiliary Field Range
AOI Area of Interest
EPA U.S. Environmental Protection Agency
NA Not Applicable
SI Site Inspection
µg/kg micrograms per kilogram
µg/L micrograms per liter